

PATENT COOPERATION TREATY

PCT/GB2004/004928

From the INTERNATIONAL BUREAU

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NOTIFICATION CONCERNING
TRANSMITTAL OF COPY OF INTERNATIONAL
PRELIMINARY REPORT ON PATENTABILITY
(CHAPTER I OF THE PATENT COOPERATION
TREATY)
(PCT Rule 44bis.1(c))

To:

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Date of mailing (day/month/year)
01 June 2006 (01.06.2006)

Applicant's or agent's file reference
P33985A/RTH/MCM

IMPORTANT NOTICE

International application No.
PCT/GB2004/004928

International filing date (day/month/year)
22 November 2004 (22.11.2004)

Priority date (day/month/year)
21 November 2003 (21.11.2003)

Applicant

THE QUEEN'S UNIVERSITY OF BELFAST et al

The International Bureau transmits herewith a copy of the international preliminary report on patentability (Chapter I of the Patent Cooperation Treaty)

The International Bureau of WIPO
34, chemin des Colombettes
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Authorized officer

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PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference P33985A/RTH/MCM	FOR FURTHER ACTION See item 4 below	
International application No. PCT/GB2004/004928	International filing date (day/month/year) 22 November 2004 (22.11.2004)	Priority date (day/month/year) 21 November 2003 (21.11.2003)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant THE QUEEN'S UNIVERSITY OF BELFAST		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a).																
2. This REPORT consists of a total of 5 sheets, including this cover sheet. In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.																
3. This report contains indications relating to the following items: <table><tr><td><input checked="" type="checkbox"/> Box No. I</td><td>Basis of the report</td></tr><tr><td><input type="checkbox"/> Box No. II</td><td>Priority</td></tr><tr><td><input type="checkbox"/> Box No. III</td><td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td></tr><tr><td><input type="checkbox"/> Box No. IV</td><td>Lack of unity of invention</td></tr><tr><td><input checked="" type="checkbox"/> Box No. V</td><td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td></tr><tr><td><input type="checkbox"/> Box No. VI</td><td>Certain documents cited</td></tr><tr><td><input type="checkbox"/> Box No. VII</td><td>Certain defects in the international application</td></tr><tr><td><input type="checkbox"/> Box No. VIII</td><td>Certain observations on the international application</td></tr></table>	<input checked="" type="checkbox"/> Box No. I	Basis of the report	<input type="checkbox"/> Box No. II	Priority	<input type="checkbox"/> Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input type="checkbox"/> Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/> Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	<input type="checkbox"/> Box No. VI	Certain documents cited	<input type="checkbox"/> Box No. VII	Certain defects in the international application	<input type="checkbox"/> Box No. VIII	Certain observations on the international application
<input checked="" type="checkbox"/> Box No. I	Basis of the report															
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<input type="checkbox"/> Box No. IV	Lack of unity of invention															
<input checked="" type="checkbox"/> Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement															
<input type="checkbox"/> Box No. VI	Certain documents cited															
<input type="checkbox"/> Box No. VII	Certain defects in the international application															
<input type="checkbox"/> Box No. VIII	Certain observations on the international application															
4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).																

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Date of issuance of this report 22 May 2006 (22.05.2006)
Facsimile No. +41 22 740 14 35	Authorized officer Dorothee Mülhausen
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T-833 P.002/005 F-286

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

REC'D 26 AUG 2005

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To:

see form PCT/ISA/220

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY
(PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/GB2004/004928

International filing date (day/month/year)
22.11.2004

Priority date (day/month/year)
21.11.2003

International Patent Classification (IPC) or both national classification and IPC
G01N33/68, C07K19/00, C12N15/62, C12N15/63, C12N5/10

Applicant
THE QUEEN'S UNIVERSITY OF BELFAST

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



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T-933 P.003/005 F-285

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/GB2004/004928

Box No. I Basis of the opinion

1. With regard to the language, this opinion has been established on the basis of the International application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the International application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☒ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☒ in written format
 - ☒ in computer readable form
 - c. time of filing/furnishing:
 - ☐ contained in the International application as filed.
 - ☐ filed together with the International application in computer readable form.
 - ☒ furnished subsequently to this Authority for the purposes of search.
3. ☒ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING
AUTHORITY (SEPARATE SHEET)**

International application No.

PCT/GB2004/004928

Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

Reference is made to the following documents:

- D1: HU C-D ET AL: "Visualization of interactions among bZIP and Rel family proteins in living cells using bimolecular fluorescence complementation" MOLECULAR CELL, CELL PRESS, CAMBRIDGE, MA, US, vol. 9, no. 4, April 2002 (2002-04), pages 789-798, XP002253973 ISSN: 1097-2765
- D2: WO 01/87919 A (YALE UNIVERSITY; HAMILTON, ANDREW, D; GHOSH, INDRANEEL; REGAN, LYNNE) 22 November 2001 (2001-11-22)

Novelty

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1 and 14 is not new in the sense of Article 33(2) PCT.

The document D1 discloses (the references in parentheses applying to this document) a composition comprising proteins fused to distinct fragments of Yellow fluorescent protein (YFP) connected by linker peptides of different lengths, i.e. KQKVMNH and RSIAT, respectively. Furthermore, a library of gene sequences encoding fusion proteins comprising fragments of YFP, a protein of interest and two different linkers interposed between the YFP and the protein of interest is disclosed (see pages 790, left-hand column and 797, left-hand column).

The same reasoning applies, mutatis mutandis, to the subject-matter of the corresponding independent claims 18, 21 and 30, which therefore are also considered not new.

Dependent claims 2-13, 15-17, 19, 20, 22, 23, 31 and 32 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step, see documents D1 and D2 and the corresponding passages cited in the search report.

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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING
AUTHORITY (SEPARATE SHEET)**

International application No.

PCT/GB2004/004928

Inventive step

The present application meets the criteria of Article 33(1) PCT, because the subject-matter of claim 24 involves an inventive step in the sense of Article 33(3) PCT.

The document D2 is regarded as being the closest prior art to the subject-matter of claim 24 and discloses (the references in parentheses applying to this document) a method for investigating protein-protein interactions of a first and second fusion protein, both comprising a distinct portion of a Green Fluorescent Protein fused to a peptide of interest through linkers of different lengths, e.g. GGSGSG or GGSG (see pages 8-10, claims 1,3,4,12,20,22,27, figure 1, examples 5,7,8 and sequences 3-6).

The subject-matter of claim 24 therefore differs from this known document in that a **plurality** of bait fusion proteins each comprising a linker of a different length is contacted with at least one prey fusion protein.

The problem to be solved by the present invention may therefore be regarded as providing a further assay method for detecting protein to protein interactions using fluorescence.

The solution proposed in claim 24 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons:

With view to the prior art cited, it is not obvious for the skilled person to provide an assay wherein a plurality of bait fusion proteins each having a linker of a different length is used to solve the problem posed, since flexible linkers increase the chance of correct association between two fusion proteins.